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# RTD TODAY

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Resources and Technology Division  
Economic Research Service  
U.S. Department of Agriculture, Washington, DC

A newsletter for employees  
and colleagues of RTD

MARCH-APRIL 1992

## FROM THE DIRECTOR'S OFFICE

In the last issue of RTD Today I shared with you my philosophy regarding the priority of research in the Division's mission. To extend that statement I want to reiterate the views that Kitty Reichelderfer and I expressed in the March-April 1988 issue of RTD Today regarding individual output.

How balanced is your output portfolio?

We have all heard often about the three main legs on which ERS stands: staff analysis, situation and outlook, and research. These three activities are interrelated and complementary, each supporting successful accomplishment of meaningful work in the others. But have you thought recently about what this triumvirate of priorities implies for the ideal mix of a Branch's, Section's, or individual's output?

Under ideal circumstances, a single investigation should result in at least three distinct outputs. First, if, as we always intend, the topic of investigation is policy-relevant, its findings warrant a brief, concise, and well-focused staff piece to aid in Departmental policy decisionmaking. Second, our role as public servants obligates us to package our findings in easily comprehended and concise terms to inform and educate the broadest possible constituency through situation and outlook reports, information bulletins, popular articles, and other reports that cover the economic aspects of major issues. Last, our professional credibility depends upon our ability to communicate with peers in the research community, a goal best achieved through successful publication of our findings in professional journals and more technical reports.

The failure to follow through on any one of these outlets jeopardizes the value of our work. For example, if one's research is available only for consumption by professional peers through journal articles, it is highly unlikely that the research findings will ever be applied directly or indirectly to improve policy or to better inform the American public of the economic tradeoffs involved in agricultural issues. On the other hand, if research results are passed on to policy decisionmakers without the back-up of peer acceptance, we run the risk of exposing policy officials to challenge in a public forum, possibly by those peers themselves--a situation which greatly impairs our usefulness in providing objective economic information to assist in policy and program decisions.

Admittedly, not every assignment or self-initiated effort lends itself to production of all three types of output. Still, each of us needs to strive to attain a sound, representative mix of the three.

FOOTNOTE: RTD Branch and other units are abbreviated in this letter, as follows:

Office of the Director (OD), Agricultural Inputs and Production Systems Branch (AI&PS), Land and Capital Assets Branch (L&CA), Resource Policy Branch (RP), Water Branch (W), and Resource Indicators Branch (RI).

A majority of the most successful analysts in RTD and in the agricultural economics profession as a whole have managed to put together a balanced portfolio of output from their work; a portfolio that contains relevant staff analyses for policy decisionmakers, good communicative devices for the public, and refereed journal articles. The importance of a well-balanced output portfolio, both for one's career in RTD and professional recognition, cannot be overemphasized. And as supervisors, we believe that your career development, growth and mobility are equally important for you and for RTD. Thus, we encourage each of you to review your output portfolio, and we offer our support and assistance in helping you assure a balanced, success-oriented output mix.



JOHN A. MIRANOWSKI

## PROGRAM HIGHLIGHTS

**ERS-RTD Ethanol Update --** ERS has undertaken a study to update selected topics on the economics of ethanol. The topics include: technological change and its effect on production costs, the environmental effects of substituting ethanol as well as other alternative fuels for conventional gasoline, the impacts of increased ethanol production on the agricultural sector and rural employment, and the interaction of agricultural and trade policies on an ethanol coproduct (corn gluten feed) market.

### Technology

Matt Rendleman and Neil Hohmann (RTD) are investigating potential technological advances that may be introduced from now to the year 2000 and their effects on ethanol production costs. They have identified several potential technological advances in the near-term:

- cogeneration of steam and electricity to lower energy costs;

- gaseous injection of sulfur dioxide to reduce steeping time and capital costs;

- membrane technology to more efficiently remove water from ethanol, resulting in energy savings;

- improved yeasts which are more tolerant of ethanol, lowering energy requirements; and

- immobilization of yeasts to permit continuous fermentation, increasing ethanol yields.

Longer-term technological advances include:

- a bacterial replacement for yeast to reduce the fermentation time and lower capital costs;

- conversion of corn hulls and portions of feed coproducts to raise the ethanol yields; and

- development of additional ethanol coproducts.

The estimated cost savings associated with near-term technologies range from \$0.05 to \$0.07 per gallon of ethanol. The long-term technologies could reduce costs by an additional \$0.04 to \$0.08 per gallon.



Finally, economical conversion of cellulose from other plants and organic waste to ethanol is expected to follow conversion of corn hulls and portions of feed coproducts. Use of zero or low cost feedstocks such as municipal waste or crop residues may significantly lower ethanol production costs in the future.

### Environmental Impacts

Stephen Crutchfield and Joseph Cooper (RTD) examine the environmental impacts of ethanol. The recent changes in the Clean Air Act have focused public attention on ways to reduce air pollution. Using ethanol blended fuels rather than conventional gasoline can help reduce certain types of air pollution. This would create economic benefits by reducing the health care costs associated with exposure to polluted air.

Adding ethanol to gasoline increases the oxygen content of fuels and reduces carbon monoxide (CO) by 15-25 percent, depending on the age and technology of the automobile. However, blending ethanol with current formulations of gasoline may increase emissions of volatile organic compounds (VOC) and nitrogen oxides (NOx) which may contribute to ozone formation.

The emissions of VOC and NOx can be controlled by using more advanced blending and refining techniques. The benefits of improved air quality must be weighed against the increased cost of the fuels.

Increased ethanol production will increase the acreage devoted to corn. While some of the added acreage comes from reduced soybean planting, the remainder may bring new land into production. This will likely increase erosion and may contribute to water quality problems.

One problem with measuring the environmental costs and benefits of increased ethanol production is that the distribution of the costs and benefits will vary across the country. Ozone problems are concentrated in a few large urban areas. However, the environmental costs arising from soil erosion will be felt primarily in the Midwest.

### Agricultural Impacts

Robert House, Mark Peters, Harry Baumes, and Terry Disney (ATAD) assess the potential impacts from additional ethanol production on agriculture. Two scenarios are considered: expanding ethanol production to 2 billion gallons per year by 1995 and 5 billion gallons per year by the year 2000.

Increasing expected ethanol production from 1.2 billion to 2 billion gallons per year by 1995 is expected to have limited impact on total farm income (value of production + government payments - variable costs). Although corn income will increase, soybean income will decrease as will government payments so total farm income changes will be limited.

Expanding ethanol production to 5 billion gallons per year by 2000 is estimated to increase total farm income by \$1.3 billion. Major crop income increases while income from livestock decreases.

### Employment Impacts

Mindy Petrulis, Judith Sommer, and Fred Hines (ARED) estimate the employment effects of the same two scenarios. Increasing ethanol production to 2 billion gallons per year by 1995 is estimated to create almost 19,000 jobs nationwide, including jobs from ethanol processing, temporary jobs from construction, and jobs from added crop production. Increasing ethanol production to 5 billion gallons per year by 2000 is estimated to create 100,000 jobs nationwide. These increases may be partially offset by decreases in employment in the petroleum industry. Employment estimates assume there is unemployment in the economy.

Integrating ethanol production with other agricultural activities, such as production of a feedstock or utilization of byproducts, offers greater employment potential. Examples are: Garden City, Kansas, where ethanol byproducts are used in greenhouses, fish ponds, and cattle feedlots; an Idaho plant that uses waste from potato processing as a feedstock; and two California plants that use cheese whey from dairy processing as a feedstock.

Current ethanol production is concentrated in a few large plants located in corn growing areas of the Midwest. Proximity to agricultural production areas means that many of the jobs created by operating plants will be in areas with smaller cities.

### Trade Policy Impacts

Margot Anderson (RTD) assesses the importance of trade policy and increased ethanol production on the corn gluten feed (CGF) market. The profitability of ethanol depends on sales of CGF. Since 1981, the coproduct credit for CGF has ranged from 43 to 53 percent (\$0.20 to \$0.33 per gallon of ethanol) of total coproduct credits. Currently, over 90 percent of total CGF production is exported to the European Community (EC).

A successful trade agreement could lead to a reduction in grain prices, which would lower the price gap between EC and world grains and make EC grain relatively more attractive to EC feed compounders. If the US expands ethanol production, there will be downward pressure on CGF prices at the same time as there are increases in the US corn price. At a price close to the price of corn, CGF becomes more attractive in the US and the increased CGF supply from ethanol production is absorbed by US feed manufacturers. Because of the increase in corn prices, CGF prices do not fall significantly. Consequently, the CGF coproduct credit to US wet millers remains close to the current level.

## EVENTS AND ACTIVITIES

### **Global Change Papers**

In February, Westview Press published Economic Issues in Global Climate Change: Agriculture, Forestry, and Natural Resources, edited by John M. Reilly and Margot Anderson. This collection of papers, which builds on papers presented at the ERS/Farm Foundation/NOAA Global Change Conference in November, 1990, begins to rectify the scarcity of economic analysis on global change issues. While the interaction between human activities and global change is increasingly acknowledged, the economic effects of global change on agriculture, forestry, and natural resources has not been adequately explored. Economic analysis of global change is increasingly important as the global change debate moves from one of scientific curiosity to serious consideration of proposals to limit the extent of global change. Despite the growing concerns about global environmental change, empirical economic analysis has been limited largely to estimates of the cost of controlling greenhouse emissions from fossil fuels. Few studies have considered the economic consequences of global climate change or have examined the economic forces contributing to biological sources of greenhouse gases. Economic considerations are paramount for defining appropriate measures of global change, determining the implications for trade and competitiveness, estimating the effects on long-term economic growth, and identifying appropriate technological and policy responses.

The papers in this volume represent a wide variety of economic techniques and perspectives that reflect the difficulty associated with modeling the economics of global change. For example, the scale of analysis ranges from farm-level models to global models; time is included through comparative static analysis or explicit dynamic paths of adjustment; global change is incorporated as an exogenous shock or enters the model endogenously. Some authors focus on methodological issues such as uncertainty, discounting, and weighting costs and benefits of trace-gas emissions. In many cases, these papers are



works in progress or initial ideas, not definitive solutions to problems. Nevertheless, the papers fill an important role in encouraging economic analysis and expanding our knowledge of global change.

This volume represents a broad cross section of current research on the economics of global change. Despite, or perhaps because of, the preliminary nature of many papers, several authors challenge conventional wisdom and question accepted empirical estimates. Perhaps more importantly, the suggestions for future research may provide guidance and motivation for those who might be beginning research in the area. The small group of researchers that has been focusing on global change over the past decade must expand because the information needs for policy analysis are likely to grow significantly in the future. This volume provides a snapshot of current economic thinking about global change and provides one starting point for researchers who are evaluating the economics of global change within the context of agriculture, forestry, and resource issues.

## **MANRRS Conference**

Rita McMillan (AI&PS) and Ken Robinson (OD) represented ERS at the 7th Annual Conference of the National Society for Minorities in Agriculture, Natural Resources, and Related Sciences (MANRRS) at Purdue University, April 3-4, 1992. MANRRS is a professional development organization for agriculture-related fields. Over 300 professionals and students attended. They represented organizations such as USDA, Monsanto, the Kellogg Foundation, and over 30 land-grant colleges.

The Conference consisted of a variety of workshops and seminars on topics ranging from **The Plight of the Migrant Worker** to **The Role of Agriculture in Urban Areas**. Student-oriented sessions on proposal writing, thesis committees, and interviewing were also featured. Ken presented information on student employment opportunities at ERS during a workshop entitled **Cooperative Education as a Tool for Recruitment**. In addition, Rita and Ken judged student presentations on ongoing research and worked with a Personnel Division representative to answer questions about employment as an economic researcher at ERS.

## **Workforce Diversity Workshop**

On May 4-5, ERS sponsored a workshop on workforce diversity in Washington, DC. The workshop was a follow-up to a similar one held last year. The purpose of the workshop was to report on the progress of ERS' workforce diversity efforts and to solicit ideas and suggestions from outside participants on issues such as recruitment, retention, and mentoring. Participants featured, among others, university faculty and administrators, and representatives from ERS and other USDA agencies. Over 50 participants attended the workshop.

The workshop was an agency-wide initiative to develop a network between ERS and outside organizations to exchange information. Outside groups invited included the National Consortium for Educational Access (NCEA), the Hispanic Association of Colleges and Universities (HACU), and the Asian Pacific American Network in Agriculture. Several representatives of these groups spoke on the first day including Leroy Ervin, Executive Director of NCEA and Laudelina Martinez, President of HACU. Joann Jenkins, Director of the Office of Advocacy and Enterprise, USDA, also described the Department's Workforce Diversity Initiative. On the second day of the workshop, participants were divided into smaller discussion groups focusing on either recruitment, retention, or mentoring. These smaller groups permitted outside participants to offer their advice and suggestions to ERS. The entire group then reconvened to hear the recommendations made in the smaller groups.

Suggestions of particular interest on each topic included:

Recruitment -- 1) Refine recruitment procedures to reflect cultural differences, including using ERS minority staff for recruiting, tailoring interview questions for specific groups, and using a "buddy" system for interviews. 2) Target recruitment efforts to focus on particular colleges, universities and professional organizations for American Indian and Hispanic American economists.

Retention -- 1) Improve communications between professional staff and supervisors. 2) Develop policies on training and maternity leave.

Mentoring -- Develop a mentoring program for all employees to promote career development and communications.

ERS representatives responded to the discussion groups' suggestions by offering to explore the recommendations and to develop an approach to addressing them.

## RTD UPDATES

As a pilot effort to improve communication with colleagues interested in activities underway in RTD, the Division has initiated the monthly data release series RTD Updates. The March release focused on pesticide and fertilizer use data from a survey of 2000 farms representing 820,900 vegetable crop acres planted in Arizona, Florida, Michigan, and Texas. The April release reported on foreign investment in U.S. agricultural land in 1991 from the filings under the Agriculture Foreign Investment Disclosure Act (AFIDA).

RTD responsibilities under the President's Water Quality and Food Safety Initiatives have emphasized the importance of an improved agrichemical data base. Highlights of the results of new agrichemical use surveys, land and water data, and conservation practices and program information will be reported quickly to the research and policy analysis community concerned with agricultural resources, the environment, food safety, global change, and technology. RTD Updates will complement the current Situation and Outlook series Agricultural Resources with timely release of information with minimal interpretation or analysis.

The Division is very interested in feedback on RTD Updates. Since this is a pilot effort, reaction on usefulness, suggestions for improvement, and merits of continuing the effort are welcomed. If you would like to be added to the mailing list or have comments, please contact the editor of RTD Today.

## ERS Administrator's Awards

RTD is especially proud of the variety of Division contributions recognized at the ERS Administrator's 13th Annual Special Merit Awards Ceremony held on March 24. RTD staff were recognized in 8 of the 21 awards given. Recipients of the Administrator's Superior Service Award from the Division included:

George Frisvold Tim Osborn Ralph Heimlich	For outstanding publications in the area of public research investment. For design of the Conservation Reserve Program bid acceptance process.
Harry Vrooman	For outstanding work on fertilizer demand.
Bruce Larson Mary Knudson	For outstanding research on biotechnology regulation.
Gene Wunderlich	For outstanding initiative, creativity, and leadership in editing and managing the Journal of Agricultural Economics Research, 1988 to 1991.
Betsey Kuhn Leslee Lowstuter Denice Bess Kenneth Robinson (Workplace Community Improvement Group)	For developing and implementing an outstanding program to improve workplace community and diversity.



Ann Vandeman  
Douglas Beach  
(Members, Fruit and Nut  
Chemical Use Survey Group)

For superior performance in assessing food safety research data needs.

William Anderson  
Dwight Gadsby  
(Members, ERS 30th  
Anniversary Organizing  
Committee)

For exceptional teamwork in planning and producing the memorable  
April 4, 1991, ERS 30th Anniversary Conference on Economics and Public  
Service.

## PEOPLE

Welcome to ...

- Christos Cabolis (RP), M.A. in Economics from California State University at Long Beach, who joined the Technology Policy Section.
- Casandra Klotz (RI), M.S. in Agricultural Economics from the University of California at Davis, who joined the Agricultural Research and Technology Assessment Section.
- Peter Feather (W), Ph.D. in Agricultural Economics from the University of Minnesota, who joined the Environmental Quality Valuation Section.

Appointment changes ...

- Marc Ribaud (RI), has been named Water Quality Coordinator.

Farewell to ...

- Jesus Dumangan (RI), who joined the Food Marketing and Consumption Economics Branch, Commodity Economics Division.

Congratulations to ...

- Marca Weinberg (RP), who received the Gordon King Dissertation Award for 1991 from the University of California at Davis.

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(October 1991 - April 1992)

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DeBraal, J. Peter. Foreign Ownership of U.S. Agricultural Land Through December 31, 1991. Staff Report No. AGES-9211. April 1992. 60 pp.

Kane, Sally, John Reilly, and James Tobey. Climate Change: Economic Implications for World Agriculture. Agricultural Economic Report No. 647. October 1991. 21 pp.

Knudson, Mary and LeRoy Hansen. Intellectual Property Rights and the Private Seed Industry. Agricultural Economic Report No. 654. November 1991. 19 pp.

Rogers, Denise. Leasing Farmland in the United States. Staff Report No. AGES-9159. January 1992. 16 pp.

Wunderlich, Gene. Owning Farmland in the United States. Agriculture Information Bulletin No. 637. January 1992. 14 pp.

## Periodicals

Wunderlich, Gene and Jim Carlin (Eds.). Journal of Agricultural Economics Research. Vol. 43, Nos. 3, 4. 1991.

## Articles

Heck, W., D. Ratloff, and G. Frisvold. **Air Quality and the Productivity of Crops and Forests**. Agriculture and the Environment. 1991 Yearbook of Agriculture. USDA. GPO. Washington, D.C. 1991. pp. 107-119.

Heimlich, Ralph E. and Arthur B. Daugherty. **American's Cropland: Where Does it Come From?** Agriculture and the Environment. 1991 Yearbook of Agriculture. USDA. GPO. Washington, D.C. 1991. pp. 3-9.

## Situation and Outlook

### Periodicals

Bull, Len and Harold Taylor (Coords.). Agricultural Resources: Inputs. Situation and Outlook Report. Nos. AR-24, AR-25. October 1991, February 1992. 47 pp, 68 pp. Contributors to the report are:  
Len Bull                      Mohinder Gill                      Noel Uri  
Herman Delvo              Harold Taylor                      Marlow Vesterby

Hexem, Roger. (Coord.) Agricultural Resources: Agricultural Land Values. Situation and Outlook Summary. April 1992. 7 pp.

Padgitt, Merritt (Coord.) Agricultural Resources: Cropland, Water, and Conservation. Situation and Outlook Report. No. AR-23. September 1991. 55 pp. Contributors to the report are:

Marcel Aillery	Clifford Dickason	Ralph Heimlich	C.T. Osborn
William Crosswhite	Art Daugherty	John Hostetler	Bill Quinby
Stephen Crutchfield	Noel Gollehon	Richard Magleby	Carmen Sandretto

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Babula, Ronald A., Douglas Duncan, and Utpal Vasavada. **Regional Responsiveness of Agricultural Interest Rates to U.S. Treasury Bill Rates**. Agricultural Income and Finance. Situation and Outlook Report No. AFO-43. December 1991. pp. 37-41.

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- Gill, Mohinder and Stan Daberkow. **Crop Sequences Among 1990 Major Field Crops and Associated Farm Program Participation.** Agricultural Resources: Inputs. Situation and Outlook Report No. AR-24. October 1991. pp. 39-46.
- Heimlich, Ralph. **New Wetland Definition Debated.** Agricultural Outlook. AO-180. ERS, USDA. November 1991. pp. 22-25.
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- Uri, Noel D. **Forecasting the Prices Paid for Farm Inputs.** Agricultural Resources: Inputs. Situation and Outlook Report No. AR-25. February 1992. pp. 35-39.
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